

## **ABSTRACT OF THE DISCLOSURE**

A method and system using a data-driven model for monocular face tracking are disclosed, which provide a versatile system for tracking three-dimensional (3D) images, e.g., a face, using a single camera. For one method, stereo data based on input image sequences is obtained. A 3D model is built using the obtained stereo data. A monocular image sequence is tracked using the built 3D model. Principal Component Analysis (PCA) can be applied to the stereo data to learn, e.g., possible facial deformations, and to build a data-driven 3D model ("3D face model"). The 3D face model can be used to approximate a generic shape (e.g., facial pose) as a linear combination of shape basis vectors based on the PCA analysis.